

Robots for Astrobiology!

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The search for life and its study is known as astrobiology. Conducting that search on other planets in our Solar System is a major goal of NASA and other space agencies, and a driving passion of the community of scientists and engineers around the world. We practice for that search in many ways, from exploring and studying extreme environments on Earth, to developing robots to go to other planets and help us look for any possible life that may be there or may have been there in the past.

The unique challenges of space exploration make collaborations between robots and humans essential. The products of those collaborations will be novel and driven by the features of wholly new environments. For space and planetary environments that are intolerable for humans or where humans present an unacceptable risk to possible biologically sensitive sites, autonomous robots or telepresence offer excellent choices. The search for life signs on Mars fits within this category, especially in advance of human landed missions there, but also as assistants and tools once humans reach the Red Planet.

For planetary destinations where we do not envision humans ever going in person, like bitterly cold icy moons, or ocean worlds with thick ice roofs that essentially make them planetary-sized ice caves, we will rely on robots alone to visit those environments for us and enable us to explore and understand any life that we may find there.

Current generation robots are not quite ready for some of the tasks that we need them to do, so there are many opportunities for roboticists of the future to advance novel types of mobility, autonomy, and bio-inspired robotic designs to help us accomplish our astrobiological goals. We see an exciting partnership between robotics and astrobiology continually strengthening as we jointly pursue the quest to find extraterrestrial life.